

LISTING OF THE CLAIMS

Claim 1 (Currently Amended): An antenna apparatus comprising:

a feed point;

a first linear antenna element which has one end connected to the feed point;

a second linear antenna element which has one end connected to the other end of the first linear antenna element;

a third linear antenna element which has one end connected to the other end of the first linear antenna element;

a fourth linear antenna element which has one end connected to the other end of the second linear antenna element; and

a connection element which connects the other end of the second linear antenna element and a ground terminal,

wherein a sum of lengths of the first, second, and fourth linear antenna elements is  $1/4$  a wavelength corresponding to a ~~series-resonance frequency~~ wavelength of the a first signal having a first frequency, ~~second, and fourth linear antenna elements~~; a sum of lengths of the second, third, and fourth linear antenna elements is  $1/2$  a wavelength corresponding to a ~~parallel-resonance frequency~~ wavelength of the a second, third, and fourth linear antenna elements signal having a second frequency,

a sum of lengths of the first and third linear antenna elements is  $1/4$  a wavelength corresponding to a ~~series-resonance frequency of the first and third linear antenna elements~~, wavelength of a third signal having a third frequency, and

the ~~parallel-resonance~~ second frequency is higher than a the first frequency of the

Docket. No.: 244003US-2SRD DIV  
Inventor: Syuichi SEKINE

~~series-resonance frequency of the first, second, and fourth linear antenna elements and lower than the series-resonance third frequency of the first and third linear antenna elements.~~

Claims 2-5 (Canceled)

Claim 6. (Currently Amended): A radio apparatus comprising:

an antenna apparatus comprising a feed point, a first linear antenna element which has one end connected to the feed point, a second linear antenna element which has one end connected to the other end of the first linear antenna element, a third linear antenna element which has one end connected to the other end of the first linear antenna element, a fourth linear antenna element which has one end connected to the other end of the second linear antenna element, and a connection element which connects the other end of the second linear antenna element and a ground terminal, wherein a sum of lengths of the first, second, and fourth linear antenna elements is  $1/4$  a wavelength corresponding to a ~~series-resonance frequency wavelength~~ of the ~~a first signal having a first frequency, second, and fourth linear antenna elements~~, a sum of lengths of the second, third, and fourth linear antenna elements is  $1/2$  a wavelength corresponding to a ~~parallel-resonance frequency wavelength~~ of the ~~a second, third, and fourth linear antenna elements~~ signal having a second frequency, a sum of lengths of the first and third linear antenna elements is  $1/4$  a wavelength corresponding to a ~~series-resonance frequency wavelength~~ of the ~~a first and third signal having a third frequency-linear antenna elements~~, and the second parallel-resonance frequency is higher than a the first frequency of the ~~series-resonance frequency of the first, second, and fourth linear antenna~~

elements and lower than the ~~series-resonance~~ third frequency ~~of the first and third linear antenna elements~~; and

a radio circuit which is connected to the feed point and transmits and receives a radio wave via the antenna comprised of the first, second third, and fourth linear antennal elements.

Claim 7 (Currently Amended): An antenna apparatus comprising:

a feed point;

a first linear antenna element which has one end connected to the feed point;

a second linear antenna element which has one end connected to the other end of the first linear antenna element;

a third linear antenna element which has one end connected to the other end of the first linear antenna element and is arranged on the same plane as the second linear antenna element; and

a connection element which connects the other end of the first linear antenna element and a ground terminal,

wherein a sum of lengths of the first and third linear antenna elements is  $1/4$  a wavelength corresponding to a ~~series-resonance~~ wavelength of a signal having a first frequency of the first and third linear antenna elements,

a sum of lengths of the second and third linear antenna elements is  $1/2$  a wavelength corresponding to a ~~parallel-resonance~~ wavelength of a signal having a second frequency of the second and third linear antenna elements,

a sum of lengths of the first and second linear antenna elements is  $1/4$  a wavelength

corresponding to a ~~series-resonance~~ wavelength of a signal having a third frequency ~~of the first and second linear antenna elements~~, and

the ~~parallel-resonance~~ second frequency is higher than the ~~series-resonance~~ first frequency ~~of the first and third linear antenna elements~~ and lower than the ~~series-resonance~~ third frequency ~~of the first and second linear antenna elements~~.

Claim 8-10 (Canceled)

Claim 11 (Currently Amended): A radio apparatus comprising:

an antenna apparatus comprising a feed point, a first linear antenna element which has one end connected to the feed point, a second linear antenna element which has one end connected to the other end of the first linear antenna element, a third linear antenna element which has one end connected to the other end of the first linear antenna element and is arranged on the same plane as the second linear antenna element, and a connection element which connects the other end of the first linear antenna element and a ground terminal, wherein a sum of lengths of the first and third linear antenna elements is  $1/4$  a wavelength corresponding to a ~~series-resonance~~ wavelength of a signal having a first frequency ~~of the first and third linear antennal elements~~,

a sum of lengths of the second and third linear antenna elements is  $1/2$  a wavelength corresponding to a ~~parallel-resonance~~ wavelength of a signal having a second frequency ~~of the second and third linear antenna elements~~, a sum of lengths of the first and second linear antenna elements is  $1/4$  a wavelength corresponding to a ~~series-resonance~~ wavelength of a

~~signal having a third frequency of the first and second linear antenna elements~~, and the ~~parallel-resonance second~~ frequency is higher than the ~~series-resonance first~~ frequency of the ~~first and third linear antenna elements~~ and lower than the ~~series-resonance third~~ frequency of the ~~first and second linear antenna elements~~; and

a radio circuit which is connected to the feed point and transmits and receives a radio wave via the antenna comprised of the first, second, and third linear antenna elements.

Claim 12 (Currently Amended): An antenna apparatus comprising:

a feed point;

a first linear antenna element which has one end connected to the feed point;

a second linear antenna element which has one end connected to the other end of the first linear antenna element;

a third linear antenna element which has one end connected to the other end of the second linear antenna element; and

a connection element which connects the other end of the second linear antenna element and a ground terminal,

wherein a sum of lengths of the first, second, and third linear antenna elements is  $1/4$  a wavelength corresponding to a ~~series-resonance~~ wavelength of a signal having a first frequency of the first, second, and third linear antenna elements,

a sum of lengths of the second and third linear antenna elements is  $1/2$  a wavelength corresponding to a ~~parallel-resonance~~ wavelength of a signal having a second frequency of the second and third linear antenna elements,

Docket. No.: 244003US-2SRD DIV  
Inventor: Syuichi SEKINE

a length of the first linear antenna element is  $1/4$  a wavelength corresponding to a ~~series-resonance~~ wavelength of a signal having a third frequency ~~of the first linear antenna element~~, and

the ~~parallel-resonance~~ second frequency is higher than the ~~series-resonance~~ first frequency ~~of the first, second, and third linear antenna elements~~ and lower than the ~~series-resonance~~ third frequency ~~of the first linear antenna element~~.

Claims 13-23 (Canceled)